



# HHS Public Access

Author manuscript

*Mt Sinai J Med.* Author manuscript; available in PMC 2015 March 17.

Published in final edited form as:

*Mt Sinai J Med.* 2012 ; 79(4): 464–474. doi:10.1002/msj.21327.

## Global Health and Primary Care: Increasing Burden of Chronic Diseases and Need for Integrated Training

Joseph Truglio, MD<sup>1</sup>, Michelle Graziano, MD<sup>1</sup>, Rajesh Vedanthan, MD<sup>1</sup>, Sigrid Hahn, MD, MPH<sup>1</sup>, Carlos Rios, MD<sup>1</sup>, Brett Hendel-Paterson, MD<sup>2</sup>, and Jonathan Ripp, MD, MPH<sup>1</sup>

<sup>1</sup>Mount Sinai School of Medicine, New York, NY

<sup>2</sup>University of Minnesota Medical School, Minneapolis, MN

### Abstract

Noncommunicable diseases, including cardiovascular disease, chronic respiratory disease, diabetes, cancer, and mental illness, are the leading causes of death and disability worldwide. These diseases are chronic and often mediated predominantly by social determinants of health. Currently there exists a global-health workforce crisis and a subsequent disparity in the distribution of providers able to manage chronic noncommunicable diseases. Clinical competency in global health and primary care could provide practitioners with the knowledge and skills needed to address the global rise of noncommunicable diseases through an emphasis on these social determinants. The past decade has seen substantial growth in the number and quality of US global-health and primary-care training programs, in both undergraduate and graduate medical education. Despite their overlapping competencies, these 2 complementary fields are most often presented as distinct disciplines. Furthermore, many global-health training programs suffer from a lack of a formalized curriculum. At present, there are only a few examples of well-integrated US global-health and primary-care training programs. We call for universal acceptance of global health as a core component of medical education and greater integration of global-health and primary-care training programs in order to improve the quality of each and increase a global workforce prepared to manage noncommunicable diseases and their social mediators.

### Keywords

global health; noncommunicable diseases; primary care

---

The rise in prevalence of noncommunicable chronic diseases (NCDs) worldwide is shaping the development of global-health programs and necessitates the further growth of our primary-care physician workforce.<sup>1</sup> The last decade has seen an explosion of growth in global-health programs across the spectrum of service delivery, aid and development, policy, research, and training.<sup>2</sup> Similarly, recent legislation in the United States has led to an ever-increasing emphasis on the importance of primary care and the need for increased

---

© 2012 Mount Sinai School of Medicine

Address Correspondence to: Jonathan Ripp, Mount Sinai School of Medicine, New York, New York, jonathan.ripp@mountsinai.org.

#### DISCLOSURES

*Potential conflict of interest:* Nothing to report.

training opportunities to address workforce deficiencies.<sup>3</sup> Both global health and primary care emphasize chronic diseases and have strong relationships to social mediators of health.<sup>4</sup> Despite this considerable overlap, training opportunities in global health are for the most part separate and distinct from training programs focusing on primary care.<sup>5–16</sup> This may be in part because, traditionally, primary care has emphasized the health of individual patients, whereas global health has emphasized the health of communities. We believe, however, that these approaches are complementary, and that greater integration of global-health and primary-care training will yield a more effective future workforce better prepared to manage the rise of NCDs.

In this article, we describe the similarities in global-health and primary-care competencies and training, outline the growth of training opportunities currently available in these areas, and call for the greater integration of training curricula as a means to address growing inequities in health, the rise of NCDs, and the need to develop a workforce suitable to meet these challenges.<sup>1</sup>

## RELATIONSHIP BETWEEN GLOBAL HEALTH AND PRIMARY CARE

Global health can be defined as “an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide.”<sup>4</sup> This broad field incorporates numerous disciplines beyond primary care and outside the biomedical sciences. Traditional “public health” focuses on the health of populations and communities, whereas global health extends this to “individual-level clinical care.” Primary care, although also addressing community health, has a clear emphasis on providing longitudinal clinical care to the individual patient. Primary care is delivered globally by all levels of providers, from community health workers to physicians. Here we focus our discussion on the critical overlap of these distinct disciplines and how this overlap can be used to meet the challenge of the global rise in NCDs through the education of medical students and residents.

### Epidemiology of Disease

Noncommunicable diseases are now the dominant disease burden worldwide, accounting for the largest number of deaths as well as disability-adjusted life-years.<sup>1</sup> Noncommunicable diseases impact low- and middle-income countries (LMICs) in addition to high-income countries (HICs). They exact a toll on human lives and disabilities, carry financial costs, and hinder economic growth.<sup>17</sup> Noncommunicable diseases include the broad categories of cardiovascular disease, chronic respiratory disease, diabetes, cancer,<sup>18</sup> and mental illness.<sup>19,20</sup> All 5 of these diseases have traditionally fallen under the purview of primary care within HICs. However, 80% of deaths from NCDs now occur in LMICs. This highlights the vital link between global health and primary care.

### Social Determinants of Health

Noncommunicable diseases share common proximate risk factors, including poor diet, physical inactivity, tobacco use, and alcohol use.<sup>18</sup> However, these risk factors and the NCDs themselves are influenced by more upstream “causes of causes” that fall under the

rubric of social determinants of health. These include economic inequality, urbanization, physical urban landscapes, agricultural and trade policies, relative prices of commodities, worksite stress, sociopolitical structures, and cultural factors.<sup>21,22</sup> Taking into account social determinants of disease requires a life-course approach to health and illness in order to adopt a continuous, comprehensive approach to care, disease prevention, and health promotion. This type of life-course approach is integral and inherent to the practice of primary care and an important framework for the multidisciplinary approach to major issues in global health.<sup>23</sup>

### Delivery of Services

In 2006, the American College of Physicians recognized primary care as the backbone of the nation's healthcare system. The needs of this system are expected to increase due to an aging population that will require more chronic-disease management.<sup>24</sup> The practice of primary care involves continuous, comprehensive care central to the management and control of NCDs. There are several examples of primary-care approaches to NCD management that have evolved in LMICs. For instance, Cambodia has developed integrated chronic-disease clinics that treat diabetes, hypertension, and human immunodeficiency virus (HIV).<sup>25</sup> Similarly, the Academic Model for the Prevention and Treatment of HIV/AIDS (AMPATH) program in Kenya has integrated NCD care into an extensive and comprehensive HIV-care delivery system.<sup>26</sup> Cameroon has successfully implemented long-term nurse management of several NCDs, such as diabetes, hypertension, and respiratory diseases.<sup>27,28</sup> As the skills required to manage patients on lifelong treatment were found to be similar across disease entities, these integrated programs demonstrated efficiency gains in human resources, drug supply chains, adherence support services, and medical-record systems. Some of these global-health advances in NCD treatment observed in LMICs have the potential to serve as models of primary-care practice in HICs.

### Shared Competencies

Global health and primary care share a set of overlapping competencies beyond those traditionally associated with the medical management of disease. Two such domains include cultural competency and spiritual competency.<sup>29</sup> Leaders in global health and in primary care have recognized the need for skills to work effectively with patients of diverse cultural and socioeconomic backgrounds. Cultural competency is one of the most commonly cited global-health competencies.<sup>30</sup> Within the primary-care setting, numerous curricular and cultural elicitation tools have been developed and assessed to improve patient-centered and clinical outcomes.<sup>31–34</sup> Such curricula tend to focus on eliciting the patient's or community's cultural framework within which they understand health and disease and provide the practitioner with skills by which to use this knowledge in formulating an appropriate treatment plan. A related yet distinct area is spiritual competency. Addressing the spiritual needs of patients and communities can improve patient perceived quality of the care.<sup>35,36</sup> Multiple acronyms have been developed to help the clinician appreciate the ways a patient understands his or her own spirituality and spiritual needs.<sup>37,38</sup> Such approaches emphasize a deepening of the therapeutic relationship and the development of appropriate treatment plans. Although no formal curricula exist, similar models can be used in global-

health settings to aid the clinician in the development of appropriate treatment plans for individual patients and to improve relationships with a community.

## CURRENT EDUCATIONAL OPPORTUNITIES

Global-health and primary-care educational opportunities have grown in both number and quality in recent years. Yet despite their complementary approach, global health and primary care tend to be taught as 2 distinct disciplines in both undergraduate and graduate medical education.

### Global Health: Undergraduate Medical Education

The majority of US medical students are interested in global health, yet there are relatively few formalized global-health curricula. According to the Association of American Medical Colleges Matriculating Student Questionnaire in 2010, 63% of students indicated an interest in global-health outreach, with more than a quarter of matriculating students having participated in 1 international health experience prior to graduation.<sup>5,39</sup> In response to this interest, the majority of US medical schools now offer some form of global-health education training, as compared with a mere 22% some 2 decades ago.<sup>40</sup> However, in 2010, 40% of graduates felt they had received inadequate global-health instruction.<sup>39</sup> Programs include student-run interest groups, inclusion of global-health content during the preclinical years, optional global-health courses for interested students, field rotations, and global-health “tracks.”<sup>5</sup> A smaller number of medical schools have affiliations with foreign institutions, with options for bidirectional student exchange. Others maintain partnerships with schools of public health, allowing students to participate in more extensive and formalized public-health education.<sup>6,41</sup> In addition, a limited number of summer intern-ships and extended year-long fellowships are available.<sup>7,8</sup>

### Global Health: Graduate Medical Education

A similar lack of formalized global-health curricula is seen in graduate medical education. The increased interest in global health among medical students has been concurrent with a rise in interest and opportunities during residency training. The percentage of pediatric residency programs offering global-health electives increased 2-fold, from 25% in 1995 to >50% in 2008.<sup>9</sup> Similar statistics are available for internal-medicine residency programs, with an estimated 57% offering global-health rotations.<sup>10</sup> However, a fewer number of programs offer formalized global-health curricula, with targeted education and training; an even smaller number have tracks or certificate programs. Within these select programs, the amount of time allotted for didactics and/or fieldwork varies considerably.<sup>11–13</sup>

### Primary Care: Undergraduate Medical Education

Current primary-care educational modalities extend beyond the confines of the traditional medical-school clerkship. Two such novel curricula are longitudinal clerkships and student-run clinics. Longitudinal care rotations are clerkships that last 8 weeks with at least one-half day per week of ambulatory-care experience. Twenty-two percent of schools offer longitudinal clerkships to some or all of their students.<sup>14</sup> The available evidence demonstrates the unique ability of this method of education to teach concepts that are

difficult to develop within the traditional 4–6-week clerkship. The few studies that have examined longitudinal care rotations demonstrate improved patient-interaction skills and understanding of chronic disease.<sup>14</sup>

Student-run clinics also offer distinct curricular advantages. More than 49 medical schools operate >110 student-run health clinics. These outreach clinics serve predominantly minority patients and see >35,000 visits annually. Student-run clinics are in a unique position to teach students principles of systems-based practice and the management of acute and chronic diseases while providing an opportunity to gain experience in navigating the complexities of healthcare systems.<sup>15</sup>

### **Primary Care: Graduate Medical Education**

The Accreditation Council for Graduate Medical Education is responsible for the accreditation of residency programs in the United States. It sets a minimum number of distinct half-day outpatient sessions for primary care-oriented specialties. Requirements vary by specialty. Internal medicine, for example, requires 130 distinct half-day outpatient sessions over the course of residency training, without specifying their distribution. Pediatrics and family medicine require 36 and 40 weeks per year, respectively, with 1 session per week. This time dedicated to longitudinal care is the resident's principal exposure to primary care.

Continuity of patient care and other core primary-care experiences have been challenged by recent limitations on work duty hours.<sup>42</sup> Efforts to improve longitudinal residency practice have ranged from improving continuity through same-day clinic scheduling to scheduling 1 week of ambulatory training after all 4-week rotations.<sup>16</sup> Despite these efforts, resident interest in the primary-care field remains relatively low.<sup>43,44</sup>

## **CALL FOR ACTION**

### **Global Rise of Noncommunicable Diseases and Equity Agenda**

Noncommunicable diseases have become the world's leading killer.<sup>45</sup> Disparities in health outcomes from NCDs between socioeconomic groups have been well documented. Low-income and low-education groups tend to have poorer health outcomes relative to high-income, well-educated groups. More recent data, however, have demonstrated that similar disparities exist between intermediate socioeconomic groups and those in the wealthier segments of society.<sup>46,47</sup> A critical understanding of social determinants of health can help eliminate the social gradient and achieve health equity.<sup>48</sup> The World Health Organization Commission on Social Determinants of Health defines health equity as “the absence of systematic differences in health, between and within countries, that are avoidable by reasonable action.” Efforts to approach systematically social determinants of health to achieve this “equity agenda” represent the beginnings of a paradigm shift within medicine and public-health research and practice.

Primary care and global health are central to this new paradigm. Even exclusively US-based primary-care providers are faced with the impact of health disparities due in part to the number of immigrants and refugees seeking care within the United States. Models have been

developed that can aid clinicians in identifying socioeconomic mediators of specific diseases such as diabetes.<sup>49</sup> Novel structural approaches have also been developed to reduce certain health disparities, such as the use of patient navigators to improve colonoscopy compliance in low-income ethnic minority patient populations.<sup>50</sup> Broader system-level approaches have sought to reduce the social gradient by integrating community resources, policy changes, and health-system optimization.

The critical role of the community within this equity agenda has recently been highlighted and its utility demonstrated in the innovative care for chronic conditions (ICCC) model.<sup>51</sup> The ICCC model modified the well-known chronic care model by enhancing the role of the community and emphasizing health policy, taking into account both the needs and strengths of communities.<sup>52</sup> This novel framework of health-intervention design promotes the use of the ICCC model in developing countries, highlighting the potential synergy of global health and primary care in chronic NCD management.

### Workforce Crisis

Despite these systems-level responses to the rise in NCDs, there remains a critical global health-care workforce crisis. Low-income countries are the most severely affected. A majority have <2.3 doctors, nurses, and midwives per 1000 people, which is the minimum number needed to deliver basic maternal and child health interventions, as defined by the World Health Organization.<sup>53</sup> The reasons for the workforce crisis vary among countries, but common themes include an inadequate and inefficient investment in healthcare provider education and training, a growing population without a commensurate increase in healthcare personnel (exacerbated by a loss of trained personnel to HIV/AIDS in affected countries), and a mismatch of supply and demand due to increasing migration of trained professionals to urban centers and higher-income countries.<sup>54</sup>

The impact of the workforce shortage is profound. A low density of healthcare workers is associated with lower access to basic services (such as immunization coverage and skilled attendants at birth) and higher mortality rates.<sup>55</sup> For example, the countries with the lowest density of health-care workers have the highest under-5 mortality rates worldwide.<sup>55</sup> At first glance, it would appear that the United States would not be affected by the global workforce crisis. The Americas (mainly United States and Canada) are home to 14% of the world's population, have only 10% of the world's disease burden, yet employ 37% of the global-health work-force, with a health-workforce density of almost 25 per 1000 population.<sup>56</sup> However, as is seen globally, there is a maldistribution of health workers and poor access to care. Twenty-one percent of the US population lives in rural areas, but only 10% of physicians practice in those areas; similar trends are seen for economically disadvantaged urban areas.<sup>57</sup> The shortage of primary-care physicians is particularly significant. A recent Institute of Medicine report estimates that 16,000 additional primary-care physicians are needed in underserved areas where community health centers are a source of primary care.<sup>58</sup> As in lower-income countries, in communities in the United States with poor access to primary care, the population has higher death and disease rates than in communities where access to primary care is better. These communities have populations that are largely composed of the uninsured, poor, and minorities.

The reasons for the primary-care workforce crisis in the United States overlap in part with those seen in lower-income countries, in particular a migration of healthcare providers away from rural or disadvantaged communities toward urban and higher-income settings. Similarly, a growing population is placing an increasing demand on the healthcare-system resources. In addition, though, the US population is aging. The combination of these 2 factors is estimated to increase the workload of adult primary-care practitioners by 29% from 2005 to 2025, whereas the number of adult primary-care practitioners is estimated to grow by only 2%–7%.<sup>57</sup> Furthermore, few US medical students are choosing careers in primary care because of growing income gaps between primary care and specialties and a perceived lower quality of work life in the current healthcare environment.<sup>44</sup>

Proposed solutions to the global-health work-force crisis and primary-care workforce crisis differ by country depending on the particulars of the healthcare system, but again several themes emerge. Although in many settings an increased investment in recruitment and training of providers is needed, approaches that do not also address the work environment and worker mobility will be inadequate.<sup>57</sup> Thus, in addition to an increased investment in the recruitment and training of providers, solutions include an improvement in salaries and working conditions, and incentives to redistribute resources within countries to medically underserved areas.<sup>56</sup> For example, both Ghana and Zambia have instituted incentive programs to help draw or retain healthcare providers in low-income or rural areas. These options include the provision of housing or housing allowances, fast-track promotion and career-development opportunities, and car or car loans and education grants for staff children, with success in keeping doctors in underserved areas.<sup>56</sup> Similarly, in the United States, a major increase in funding has been proposed for the National Health Service Corps, which provides scholarships and debt forgiveness for health professional school education and has brought many primary-care physicians to underserved areas.<sup>57</sup> Another proposed solution in sub-Saharan Africa has been to provide more scholarships to poor students and those from rural areas, and, in some cases, relaxing the entry criteria for medical school. In Malawi, additional academic support was provided to increase numbers of students being trained.<sup>56</sup> Similarly, in the United States there are calls to increase the number of minorities and students from rural areas in medical schools, as they are more likely to ultimately practice in minority and rural settings.<sup>57</sup>

## **SUGGESTIONS FOR MOVING FORWARD**

Responding to the global rise in NCDs requires increasing the number of healthcare providers capable of effectively and efficiently managing these diseases. To do so, we call for an expansion of global-health training programs and improved integration of these programs with primary-care curricula (Table 1).

### **Global-Health Curricula and Field Opportunities**

Global-health education highlights the presence of health inequities and prepares trainees to address such health disparities. By recognizing global health as a core component of training, it will become easier for students and residents to secure time and funding to pursue activities in LMICs. All programs (medical schools and residencies) should have global-health fieldwork options that are preceded by adequate training and supervised by

experienced faculty. This may necessitate that smaller institutions form partnerships with more established centers.

This in turn will have important implications for the decrease in matriculating residents entering into primary-care specialties that has been observed over the past few decades.<sup>59</sup> Studies indicate that those individuals participating in global-health experiences are more likely to change focus from subspecialty training to primary-care medicine, with increased interest in underserved US communities.<sup>12,13,60–63</sup>

### Greater Integration and Improved Training

Exposure to global-health training leads to improved physical examination and diagnostic skills, enhanced cultural sensitivity, greater attention to cost-effectiveness, and an increased likelihood to pursue careers working with the underprivileged.<sup>12,13,60–63</sup> The acquisition of these benefits is dependent on the quality of the global-health experience. Less than half of global-health participants recently surveyed received structured training for work/volunteering abroad.<sup>9</sup> Such lack of predeparture education can affect the impact of the experience on the provider, and more importantly the result on the targeted community. Predeparture curricula ideally include information tailored to the specific project of the resident or student, such as knowledge-based curricula on the region (eg, demographics, culture, social determinants of health, and regional health-system structure) and skills-based curricula related to the participant's fieldwork (eg, field-based research methodology, ethical study design considerations, community-based partnerships, and capacity-building strategies). The method of delivery of such content ultimately depends on the strengths of the individual institutions and their partners. For example, institutions with schools of public health may offer formal statistics classes, and others may develop computer-based curricula or project-design meetings with hospital-based statisticians.

We call for an increased growth and better integration of training in these areas to address 3 related challenges: the rise of NCDs worldwide, the seemingly ever-present socially mediated gap in health between rich and poor, and the crisis in the development of a workforce equipped to meet these challenges.

The considerable overlap between global health and primary care has created many opportunities for greater integration of training within these 2 disciplines. Through such integration global-health training provides many unique educational opportunities, including but not limited to international fieldwork, such as the application of clinical skills within diverse patient populations and the examination of disease processes at the population level. This produces a larger framework within which to learn and utilize primary-care competencies, particularly those that deal with poverty, cultural and linguistic barriers, and resource allocation. Several models for integrated curricula already exist (Table 2). These programs improve the quality of participants' global-health training by grounding it within a formal, longitudinal curriculum. Likewise, primary-care education is enhanced by the unique educational experiences offered by global-health fieldwork.



## CONCLUSION

Both global health and primary care are rapidly evolving fields influenced by numerous changes in health and healthcare, perhaps most notably the rise of NCDs. Training opportunities in global health and primary care are on the rise, and some are beginning to integrate their curricula to address the overlap between the 2 disciplines. Further integration is necessary to address the coming rise in NCDs and the implications related to social health equity and the workforce crisis.

## References

1. World Health Organization. The Global Burden of Disease: 2004 Update. Geneva: World Health Organization; 2004. [Accessed March 2012]
2. Landrigan PJ, Ripp J, Murphy RJ, et al. New academic partnerships in global health: innovations at Mount Sinai School of Medicine. *Mt Sinai J Med.* 2011; 78:470–482. [PubMed: 21598272]
3. Davis K, Abrams M, Stremikis K. How the Affordable Care Act will strengthen the nation's primary care foundation. *J Gen Intern Med.* 2011; 26:1201–1203. [PubMed: 21523495]
4. Koplan JP, Bond TC, Merson MH, et al. Towards a common definition of global health. *Lancet.* 2009; 373:1993–1995. [PubMed: 19493564]
5. Drain PK, Primack A, Hunt DD, et al. Global health in medical education: a call for more training and opportunities. *Acad Med.* 2007; 82:226–230. [PubMed: 17327707]
6. Goldner BW, Bollinger RC. Global health education for medical students: new learning opportunities and strategies. *Med Teach.* 2012; 34:e58–e63. [PubMed: 22250696]
7. Fogarty International Clinical Research Scholars and Fellows. [Accessed March 2012] <https://fogartyscholars.org>
8. American Medical Student Association. [Accessed March 2012] International health opportunities directory. <http://www.amsa.org/AMSA/Homepage/EducationCareerDevelopment/IntlHealthOpps.aspx>
9. Nelson BD, Lee AC, Newby PK, et al. Global health training in pediatric residency programs. *Pediatrics.* 2008; 122:28–33. [PubMed: 18595983]
10. Kolars JC, Halvorsen AJ, McDonald FS. Internal medicine residency directors perspectives on global health experiences. *Am J Med.* 2011; 124:881–885. [PubMed: 21658664]
11. Evert, J.; Stewart, C.; Chan, K., et al. Developing Residency Training in Global Health: A Guidebook. San Francisco, CA: Global Health Educational Consortium; 2008. [http://globalhealtheducation.org/resources\\_OLD/Documents/Both%20Students%20And%20Faculty/GHEC%20Residency%20Guidebook.pdf](http://globalhealtheducation.org/resources_OLD/Documents/Both%20Students%20And%20Faculty/GHEC%20Residency%20Guidebook.pdf) [Accessed March 2012]
12. Gupta AR, Wells CK, Horwitz RI, et al. The International Health Program: the fifteen-year experience with Yale University's Internal Medicine Residency Program. *Am J Trop Med Hyg.* 1999; 61:1019–1023. [PubMed: 10674689]
13. Miller WC, Corey GR, Lallinger GJ, et al. International health and internal medicine residency training: the Duke University experience. *Am J Med.* 1995; 99:291–297. [PubMed: 7653490]
14. Ogrinc G, Mutha S, Irby DM. Evidence for longitudinal ambulatory care rotations: a review of the literature. *Acad Med.* 2002; 77:688–693. [PubMed: 12114141]
15. Meah YS, Smith EL, Thomas DC. Student-run health clinic: novel arena to educate medical students on systems-based practice. *Mt Sinai J Med.* 2009; 76:344–356. [PubMed: 19642148]
16. Mariotti JL, Shalaby M, Fitzgibbons JP. The 4:1 schedule: a novel template for internal medicine residencies. *J Grad Med Educ.* 2010; 2:541–547. [PubMed: 22132275]
17. Bloom, DE.; Cafiero, ET.; Jané-Llopis, E., et al. The Global Economic Burden of Non-Communicable Diseases. Geneva: World Economic Forum; 2011. Harvard School of Public Health and World Economic Forum. [http://www3.weforum.org/docs/WEF\\_Harvard\\_HE\\_GlobalEconomicBurdenNonCommunicableDiseases\\_2011.pdf](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf) [Accessed March 2012]

18. United Nations. Prevention and Control of Non-Communicable Diseases: Report of the Secretary-General. Presented at: United Nations High-Level Meeting on Non-communicable Disease; May 2011; New York, NY. [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/66/83&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/66/83&Lang=E)
19. Raviola G, Becker AE, Farmer P. A global scope for global health—including mental health. *Lancet*. 2011; 378:1613–1615. [PubMed: 22008421]
20. Patel V, Boyce N, Collins PY, et al. A renewed agenda for global mental health. *Lancet*. 2011; 378:1441–1442. [PubMed: 22008422]
21. World Health Organization, Commission on Social Determinants of Health. Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health. Geneva: World Health Organization; 2008. [http://www.who.int/social\\_determinants/thecommission/finalreport/en/index.html](http://www.who.int/social_determinants/thecommission/finalreport/en/index.html) [Accessed March 2012]
22. Rasanathan K, Krech R. Action on social determinants of health is essential to tackle non-communicable diseases. *Bull World Health Organ*. 2011; 89:775–776. [PubMed: 22084516]
23. Harper S, Lynch J, Smith GD. Social determinants and the decline of cardiovascular diseases: understanding the links. *Annu Rev Public Health*. 2011; 32:39–69. [PubMed: 21219168]
24. American College of Physicians. The Impending Collapse of Primary Care Medicine and Its Implication for the State of the Nation’s Health Care: A Report From the American College of Physicians. Philadelphia, PA: American College of Physicians; 2006. [http://www.acponline.org/advocacy/events/state\\_of\\_healthcare/statehc06\\_1.pdf](http://www.acponline.org/advocacy/events/state_of_healthcare/statehc06_1.pdf) [Accessed March 2012]
25. Janssens B, Van Damme W, Raleigh B, et al. Offering integrated care for HIV/AIDS, diabetes and hypertension within chronic disease clinics in Cambodia. *Bull World Health Organ*. 2007; 85:880–885. [PubMed: 18038079]
26. Bloomfield GS, Kimaiyo S, Carter EJ, et al. Chronic non-communicable cardiovascular and pulmonary disease in sub-Saharan Africa: an academic model for countering the epidemic. *Am Heart J*. 2011; 161:842–847. [PubMed: 21570512]
27. Unwin N, Mugusi F, Aspray T, et al. Tackling the emerging pandemic of non-communicable diseases in sub-Saharan Africa: the essential NCD health intervention project. *Public Health*. 1999; 113:141–146. [PubMed: 10910412]
28. Kengne AP, Awah PK, Fezeu LL, et al. Primary health care for hypertension by nurses in rural and urban sub-Saharan Africa. *J Clin Hypertens (Greenwich)*. 2009; 11:564–572. [PubMed: 19817937]
29. Sulmasy DP. Spirituality, religion, and clinical care. *Chest*. 2009; 135:1634–1642. [PubMed: 19497898]
30. Battat R, Seidman G, Chadi N, et al. Global health competencies and approaches in medical education: a literature review. *BMC Med Educ*. 2010; 10:94. [PubMed: 21176226]
31. Berlin EA, Fowkes WC Jr. A teaching framework for cross-cultural health care: application in family practice. *West J Med*. 1983; 139:934–938. [PubMed: 6666112]
32. McElmurry BJ, McCreary LL, Park CG, et al. Implementation, outcomes, and lessons learned from a collaborative primary health care program to improve diabetes care among urban Latino populations. *Health Promot Pract*. 2009; 10:293–302. [PubMed: 18344318]
33. Sequist TD, Fitzmaurice GM, Marshall R, et al. Cultural competency training and performance reports to improve diabetes care for black patients: a cluster randomized, controlled trial. *Ann Intern Med*. 2010; 152:40–46. [PubMed: 20048271]
34. Thom DH, Tirado MD, Woon TL, et al. Development and evaluation of a cultural competency training curriculum. *BMC Med Educ*. 2006; 6:38. [PubMed: 16872504]
35. Astrow AB, Wexler A, Texeira K, et al. Is failure to meet spiritual needs associated with cancer patients’ perceptions of quality of care and their satisfaction with care? *J Clin Oncol*. 2007; 25:5753–5757. [PubMed: 18089871]
36. Clark PA, Drain M, Malone MP. Addressing patients’ emotional and spiritual needs. *Jt Comm J Qual Saf*. 2003; 29:659–670. [PubMed: 14679869]
37. Maugans TA. The SPIRITual history. *Arch Fam Med*. 1996; 5:11–16. [PubMed: 8542049]
38. Puchalski CM. Spirituality and end-of-life care: a time for listening and caring. *J Palliat Med*. 2002; 5:289–294. [PubMed: 12006231]

39. Association of American Medical Colleges. Matriculating student questionnaire: all schools summary report. Washington, DC: Association of American Medical Colleges; 2010. <https://www.aamc.org/download/269322/data/msq2011.pdf> [Accessed March 2012]
40. Heck JE, Wedemeyer D. A survey of American medical schools to assess their preparation of students for overseas practice. *Acad Med.* 1991; 66:78–81. [PubMed: 1993106]
41. Ackerly DC, Udayakumar K, Taber R, et al. Perspective: Global medicine: opportunities and challenges for academic health science systems. *Acad Med.* 2011; 86:1093–1099. [PubMed: 21785305]
42. Antiel RM, Thompson SM, Hafferty FW, et al. Duty hour recommendations and implications for meeting the ACGME core competencies: views of residency directors. *Mayo Clin Proc.* 2011; 86:185–191. [PubMed: 21307391]
43. Keirns CC, Bosk CL. Perspective: The unintended consequences of training residents in dysfunctional outpatient settings. *Acad Med.* 2008; 83:498–502. [PubMed: 18448907]
44. Rieselbach RE, Crouse BJ, Frohna JG. Teaching primary care in community health centers: addressing the workforce crisis for the underserved. *Ann Intern Med.* 2010; 152:118–122. [PubMed: 20008743]
45. New WHO report: deaths from noncommunicable diseases on the rise, with developing world hit hardest [press release]. Moscow: World Health Organization; Apr 27. 2011 [http://www.who.int/mediacentre/news/releases/2011/ncds\\_20110427/en/index.html](http://www.who.int/mediacentre/news/releases/2011/ncds_20110427/en/index.html) [Accessed March 2012]
46. Braveman PA, Cubbin C, Egerter S, et al. Socioeconomic disparities in health in the United States: what the patterns tell us. *Am J Public Health.* 2010; 100(suppl 1):S186–S196. [PubMed: 20147693]
47. Wilkinson, R.; Marmot, M. *Social Determinants of Health: The Solid Facts. 2.* Geneva: World Health Organization; 2003.
48. United Nations. *Reducing Health Inequities Through Action on the Social Determinants of Health.* Presented at: 62nd World Health Assembly; May 22, 2009; [http://apps.who.int/gb/ebwha/pdf\\_files/A62/A62\\_R14-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/A62/A62_R14-en.pdf)
49. Brown AF, Ettner SL, Piette J, et al. Socioeconomic position and health among persons with diabetes mellitus: a conceptual framework and review of the literature. *Epidemiol Rev.* 2004; 26:63–77. [PubMed: 15234948]
50. Christie J, Itzkowitz S, Lihau-Nkanza I, et al. A randomized controlled trial using patient navigation to increase colonoscopy screening among low-income minorities. *J Natl Med Assoc.* 2008; 100:278–284. [PubMed: 18390020]
51. Syme SL. Social determinants of health: the community as an empowered partner. *Prev Chronic Dis.* 2004; 1:A02. [PubMed: 15634364]
52. Epping-Jordan JE, Pruitt SD, Bengoa R, et al. Improving the quality of health care for chronic conditions. *Qual Saf Health Care.* 2004; 13:299–305. [PubMed: 15289634]
53. [Accessed March 2012] Health workers: a global profile. *The World Health Report 2006: Working Together for Health.* <http://www.who.int/whr/2006/en>
54. Narasimhan V, Brown H, Pablos-Mendez A, et al. Responding to the global human resources crisis. *Lancet.* 2004; 363:1469–1472. [PubMed: 15121412]
55. Chen L, Evans T, Anand S, et al. Human resources for health: overcoming the crisis. *Lancet.* 2004; 364:1984–1990. [PubMed: 15567015]
56. Anyangwe SC, Mtonga C. Inequities in the global health workforce: the greatest impediment to health in sub-Saharan Africa. *Int J Environ Res Public Health.* 2007; 4:93–100. [PubMed: 17617671]
57. Bodenheimer T, Pham HH. Primary care: current problems and proposed solutions. *Health Aff (Millwood).* 2010; 29:799–805. [PubMed: 20439864]
58. Institute of Medicine, Committee on the Future Health Care Workforce for Older Americans. *Retooling for an Aging America: Building the Health Care Workforce.* Washington, DC: National Academies Press; 2008. [http://books.nap.edu/openbook.php?record\\_id=12089](http://books.nap.edu/openbook.php?record_id=12089) [Accessed March 2012]

59. Association of American Medical Colleges. [Accessed March 2012] Why Is There a Shortage of Primary Care Doctors?. <https://www.aamc.org/linkableblob/70310-5/data/primarycarefs-data.pdf>. Published 2008
60. Godkin M, Savageau J. The effect of medical students' international experiences on attitudes toward serving underserved multicultural populations. *Fam Med*. 2003; 35:273–278. [PubMed: 12729313]
61. Ramsey AH, Haq C, Gjerde CL, et al. Career influence of an international health experience during medical school. *Fam Med*. 2004; 36:412–416. [PubMed: 15181553]
62. Thompson MJ, Huntington MK, Hunt DD, et al. Educational effects of international health electives on U.S. and Canadian medical students and residents: a literature review. *Acad Med*. 2003; 78:342–347. [PubMed: 12634222]
63. Quinn TC. The Johns Hopkins center for global health: transcending borders for world health. *Acad Med*. 2008; 83:134–142. [PubMed: 18303357]

**Table 1****Summary and Recommendations.**

---

**Summary**

NCDs diseases are the leading causes of death and disability worldwide.

Social determinants of health are major contributors to NCDs.

There is a global workforce crisis of providers able to address NCDs.

Global health and primary care are uniquely capable of addressing NCDs, in part due to their emphasis on addressing social determinants of health.

Many global-health programs do not have formal curricula.

Global-health and primary-care training programs are complementary and share numerous competencies.

The vast majority of training programs present global health and primary care as distinct disciplines.

**Recommendations**

Universal acceptance of global health as a core component of primary-care medical education will improve the quality of training programs.

Greater integration of global-health and primary-care training programs will increase a global workforce prepared to manage NCDs and their social mediators.

**Suggested methods for further integration of global-health and primary-care training****Undergraduate medical education**

Teaching cultural competency, spiritual competency, and communication skills via standardized patient experience during the preclinical years.

Integration of these competencies formally into evaluations of clinical performance in the clinical years.

Didactic sessions on global, national, and local health disparities throughout the 4-year curriculum.

Longitudinal curriculum on social-barriers to management of chronic diseases.

**Graduate medical education**

Partnerships between institutions to allow for increased access to global-health fieldwork.

Integration of specific global-health competencies into primary-care didactic curricula (eg, use of cultural competency in smoking cessation, addressing social determinants of health when teaching nutritional counseling).

---

**Abbreviations:** NCDs, noncommunicable diseases.

**Table 2**

**Integrated Global Health and Primary Care Graduate Medical Education Curricula.**

<b>Institution</b>	<b>Department(s)</b>	<b>Curricular Highlights/Innovations</b>	<b>Additional Certifications</b>
University of Minnesota	Internal medicine, family medicine, pediatrics	Structured coursework and fieldwork; primary care well integrated into curriculum; continuity clinics at travel, international adoption, and refugee health clinics	Certificate of knowledge in clinical tropical medicine and traveler's health
Stanford University	Internal medicine	Residency training extended by 1 year; global health journal club; case-based tropical medicine courses; unique continuity clinic	Master of science
Massachusetts General Hospital	Internal medicine	Global primary care residency within the internal medicine residency; 10 months of international fieldwork at partner sites; continuity clinic serving postincarceration and other high-risk populations	Master of public health
Johns Hopkins School of Medicine	Internal medicine and pediatrics	Combined internal medicine and pediatrics residency with a primary-care urban-health curriculum; optional 2 additional years to obtain an advanced degree while practicing as an urban primary-care physician	Optional master of public health, master of education, master of business administration, or master of behavioral health
Mount Sinai School of Medicine	Internal medicine, pediatrics, obstetrics and gynecology, psychiatry*	Combined internal medicine and pediatrics residency with a global-health curriculum, including mandatory fieldwork preparation course, epidemiology, biostatistics, medical anthropology; interdisciplinary global health residency with 6 weeks of fieldwork; medical student 8-week summer global health fieldwork project, including predeparture curriculum, ongoing mentorship, and goal of publication or poster presentation; global health 1–2-year fellowship postresidency; New York City–based global health rotations in tropical medicine, travel medicine, immigrant health, torture survivors, and tuberculosis	Master of public health in global health; additional certificates (such as tropical medicine) available for residents who enter the program with a master of public health degree

\* Primary care often refers exclusively to internal medicine, pediatrics, family medicine, and related services. Obstetrics and gynecology and psychiatry are included here as primary care, as they provide primary women's health and primary mental health services, respectively. Further, obstetrics and gynecology providers, particularly in low- and middle-income countries, are frequently the only clinicians providing care to an individual and thus deliver broader primary-care services.